



nucleartechnology®

EDITOR:

ROY G. POST

Department of Nuclear Engineering
University of Arizona
Tucson, Arizona 85721

ASSOCIATE EDITOR:

KARL WIRTZ

Kernforschungszentrum Karlsruhe
Institut für Neutronenphysik und Reaktortechnik
75 Karlsruhe, Postfach 3640, Germany

VOLUME 32

**January, February,
March 1977**

AMERICAN NUCLEAR SOCIETY

244 EAST OGDEN AVENUE • HINSDALE, ILLINOIS 60521 USA

Journal of Nuclear Energy

Volume 15, Number 1, 1977

Editor

Editorial Board

Associate Editor

Karl Wirtz

Editorial Board

Copyright © 1977 by American Nuclear Society, Inc., Hinsdale, Illinois 60521

Volume 15

January, February

March 1977

AMERICAN NUCLEAR SOCIETY
500 EAST 57TH STREET, SUITE 1000, NEW YORK, NY 10022

210

CONTENTS OF VOLUME 32

JANUARY 1977—VOL. 32, NO. 1

MATERIALS IN WASTE STORAGE

- 5 Preface / *The Editor*

TECHNICAL PAPERS

- 6 Materials Considerations in Radioactive Waste Storage / *Warren K. Eister*
- 10 Hanford Waste Encapsulation: Strontium and Cesium / *R. R. Jackson*
- 16 Stabilization and Storage of Solidified High-Level Radioactive Wastes / *J. R. Berreth, A. P. Hoskins, J. A. Rindfleisch*
- 25 Packaging Rocky Flats Waste / *Charles E. Wickland*
- 30 Some Techniques for the Solidification of Radioactive Wastes in Concrete / *Peter Colombo, Robert M. Neilson, Jr.*
- 39 Leach Behavior of Hydrofracture Grout Incorporating Radioactive Wastes / *J. G. Moore, H. W. Godbee, A. H. Kibbey*
- 53 Packaging of Tritium-Contaminated Liquid Waste / *E. A. Mershad, W. W. Thomasson, J. J. Dauby*
- 60 The Canadian Spent Fuel Storage Canister: Some Materials Aspects / *Derek G. Boase, Tjalle T. Vandergraaf*
- 72 High-Level Waste Glass / *John E. Mendel*
- 88 High-Level Waste Glass: Field Leach Test / *W. F. Merritt*
- 92 High-Level Waste Ceramics: Materials Considerations, Process Simulation, and Product Characterization / *Gregory J. McCarthy*

DEPARTMENTS

- 1 Authors
- 106 Book Reviews

CONTENTS OF VOLUME 32 *continued*

FEBRUARY 1977—VOL. 32, NO. 2

TECHNICAL PAPERS

REACTORS

- 115 *In Situ* Regeneration of Fusion Reactor First Walls / J. Chin, T. Ohkawa
- 125 Analysis of Reactor Component Fluence Limits Using Damage Function Methods / G. R. Odette, R. L. Simons, W. N. McElroy, D. G. Doran
- 142 Toroidal Field Strength Requirements in Tokamak Reactors / W. M. Stacey, Jr., K. Evans, Jr.
- 155 Sensitivity Assessments in Reactor Safety Analysis / J. E. Kelly, F. L. Leverenz, Jr., N. J. McCormick, R. C. Erdmann

CHEMICAL PROCESSING

- 167 Study of the Dissolution of Refractory PuO_2 in Nitric-Hydrofluoric Acid Dissolvents at 100°C / O. K. Tallent, J. C. Mailen

FUELS

- 176 Uranium-236 in Light Water Reactor Spent Fuel Recycled to an Enriching Plant / A. de la Garza
- 186 The Reactivity Perturbation Assay of Irradiated Fuel Rods / L. Green, J. T. Kriese, M. Natelson

RADIOISOTOPES

- 205 A Gamma-Ray Perimeter Security System / Donald A. Close

DEPARTMENTS

- 111 Authors
- 211 Book Reviews
- 214 Letter to the Editor

CONTENTS OF VOLUME 32 *continued*

MARCH 1977—VOL. 32, NO. 3

- 221 Editorial: *NT Letters*—Early Reports of Important Results / *The Editor*

TECHNICAL PAPERS

REACTORS

- 222 Optimal Synthesis of a Power Plant Cooling System / *L. T. Fan, David F. Aldis*
- 239 Properties of Light Water Reactor Core Melts / *S. Nazaré, G. Ondracek, B. Schulz*
- 247 Reliability Analysis of the Decay Heat Removal System of a 1000-MW(e) Gas-Cooled Fast Breeder Reactor / *D. Bittermann, J. Wehling*
- 257 Comparison of the Power Distribution in Uranium and Plutonium Fuel Elements in the KWO Core / *Dieter Sommer*

FUELS

- 276 Mechanical Response of UO_2 Subjected to Transient Heating / *B. J. Wrona, J. T. A. Roberts, T. M. Galvin, G. T. Higgins*

MATERIALS

- 290 The Overall Probability of Detection in Connection with the Optimization of Safeguards Effort / *Günter Hartmann*
- 297 Equilibrium Pressure and Solubility of Hydrogen in Liquid Lithium / *Hiroji Katsuta, Takahiro Ishigai, Kazuo Furukawa*
- 304 Sodium Purification by Cold Trapping at the Experimental Breeder Reactor II / *J. T. Holmes, C. R. F. Smith, M. M. Osterhout, W. H. Olson*

RADIOISOTOPES

- 315 A Californium-252 Fission Spectrum Irradiation Facility for Neutron Reaction Rate Measurements / *J. A. Grundl, V. Spiegel, C. M. Eisenhauer, H. T. Heaton II, D. M. Gilliam, J. Bigelow*

(Continued)

CONTENTS OF VOLUME 32 *continued*

MARCH 1977—VOL. 32, NO. 3

(Continued)

TECHNICAL NOTE

REACTORS

- 320** The Application of SPOOL-FIRE in Theoretical Analysis and Experimental Comparison / *Lucy Wu Person*

DEPARTMENTS

- 217** Authors
- 326** Volume 32 Indexes